

CLAIMS

1. An ionization method using cluster-ion impact,  
comprising steps of:

generating charged droplets of a volatile liquid  
5 in a state in which the droplets are cooled so as to  
suppress vaporization thereof;

introducing the charged droplets generated into an  
evacuated chamber; and

forming an electric field in the evacuated chamber  
10 and accelerating the charged droplets by the electric  
field to cause them to bombard a sample, thereby  
desorbing and ionizing the sample.

2. An ionization apparatus using cluster-ion impact,  
comprising:

15 an accelerator having an evacuated acceleration  
chamber, in the interior of which accelerating  
electrodes and a sample table are disposed, provided  
outside of an ion introduction port of a mass analyzer  
and communicating with the interior of the mass  
20 analyzer through the ion introduction port; and

a charged-droplet generating device, which has a  
charged-droplet generating chamber that communicates  
with said evacuated acceleration chamber through a  
droplet introduction port of said evacuated  
25 acceleration chamber, for generating charged droplets  
of a volatile liquid in the charged-droplet generating  
chamber in a state in which the droplets are cooled so

as to suppress vaporization thereof;

wherein the charged droplets generated by said charged-droplet generating device are introduced from said charged-droplet generating chamber to said  
5 evacuated acceleration chamber through said droplet introduction port, the droplets are accelerated by said accelerating electrodes, to which a high voltage has been applied, and bombard a sample on the sample table, and ions of the sample desorbed and ionized thereby are  
10 introduced to the mass analyzer through said ion introduction port.